IJoLTE 10 (1) (2026)
E-ISSN: 2598-2303
International Journal of Language Teaching and Education
https://online-journal.unja.ac.id/IJoLTE
DOI: 10.22437/ijolte.v10i1.56588

EFL Students' Functional and Cognitive Dependency on ChatGPT in EFL Academic Writing

Fitri Awalia Putri[1], Suratman[2], Annisah[3], Waliyudin[4]
[1,2,3] STKIP Taman Siswa Bima, Bima, Indonesia
[4]Universitas Muhammadiyah Bima, Bima, Indonesia
Corresponding author email: fitriawalia914@gmail.com

Info Article
Received: 06 June 2026
Revised: 08 June 2026
Accepted: 10 June 2026
Online Version: 12 June 2026

Abstract
The increasing use of ChatGPT in academic writing has raised concerns about students' dependency on artificial intelligence, particularly in EFL contexts. This study examines students' functional and cognitive dependency on ChatGPT as theoretically distinct constructs and describes dependency patterns across gender. A descriptive quantitative design was employed involving ten fourth-semester English Education students at STKIP Taman Siswa Bima. Data were collected through a questionnaire (functional: α = .830; cognitive: α = .632) and self-reflection responses analysed thematically, with findings triangulated to strengthen credibility. The results revealed higher functional dependency (M = 3.66) than cognitive dependency (M = 3.29). Students primarily relied on ChatGPT for grammar correction, vocabulary improvement, sentence construction, and paraphrasing, while cognitive support was associated with idea generation and argument development. Thematic analysis yielded three themes: reasons for use, perceived benefits, and awareness of over-reliance. Gender differences were minimal. The novelty of this study lies in demonstrating that AI dependency operates across qualitatively different levels of the writing process, extending AI-assisted writing frameworks and contributing to learner autonomy discourse by suggesting that EFL learners can exercise selective AI use as a form of strategic autonomy.

Keywords: Academic writing; ChatGPT; EFL students; Functional dependency; Cognitive dependency

This is open access article under the CC -BY licence

INTRODUCTION

Artificial intelligence (AI) has increasingly influenced educational practices, particularly in academic writing, where students use AI-powered tools to support various writing tasks (Yıldız, 2025; Zhao & Li, 2024). Among recent applications, ChatGPT has gained significant attention due to its ability to generate human-like text and provide immediate assistance during the writing process (Lingard, 2023; Nepal, 2024). In the English as a foreign language (EFL) context, ChatGPT is frequently used to assist students in correcting grammatical errors, improving vocabulary, paraphrasing texts, organizing ideas, and developing writing arguments (Mun, 2024; Sudrajad et al., 2024). These capabilities make ChatGPT a practical tool for addressing common challenges encountered in academic writing (Yuan et al., 2024).

Despite its benefits, the growing use of ChatGPT has raised concerns regarding students' dependency on AI-assisted writing tools. While AI can facilitate writing performance and reduce linguistic difficulties, excessive reliance may affect students' independent learning processes and cognitive engagement (Qawqzeh, 2024; Teubner et al., 2023). Previous studies have suggested that AI tools may

gradually shift from serving as learning support to becoming substitutes for students' own efforts if used without sufficient critical evaluation (Baltezarević & Battista, 2025). Consequently, understanding the nature of students' dependency on ChatGPT has become an important issue in language education (Al-obaydi et al., 2023). Recent literature distinguishes dependency on AI into two dimensions: functional dependency and cognitive dependency (Zhai et al., 2024). Functional dependency refers to students' reliance on AI for technical aspects of writing, such as grammar correction, vocabulary selection, sentence construction, and paraphrasing (Graham & Milan, 2025). Cognitive dependency, in contrast, refers to reliance on AI for higher-order processes, including idea generation, information organization, argument development, and reasoning (Fan & Tan, 2023; Yatani et al., 2024). Although both forms of dependency may support writing performance, cognitive dependency is considered more critical because it directly relates to students' intellectual autonomy and higher-order thinking skills (Butson & Spronken-Smith, 2024).

For EFL students, this issue is particularly relevant because linguistic limitations often encourage greater use of AI-based writing assistance (Aldabbus & Almansouri, 2022). While such support can improve writing efficiency and confidence, it may also reduce opportunities for students to actively engage in planning, organizing, and critically evaluating their own ideas (Pitts et al., 2025; Zou et al., 2023). Therefore, identifying how students rely on ChatGPT is necessary to better understand its educational implications and to support the responsible integration of in academic writing instruction (Almasari, 2022; Raptopoulou et al., 2024). Although previous studies have examined AI-assisted writing, technology dependency, and educational use of ChatGPT, most have treated dependency as a single, undifferentiated construct without distinguishing between surface-level linguistic reliance and deeper cognitive engagement (Al-obaydi et al., 2023; Waliyudin & Annisah, 2023). This conflation limits the explanatory power of existing frameworks, as it obscures whether students are merely outsourcing technical writing tasks or surrendering higher-order thinking processes to AI. Separating functional dependency, which pertains to grammar correction, vocabulary selection, and paraphrasing, from cognitive dependency, which involves idea generation, argumentation, and reasoning, offers a more theoretically precise lens for understanding how AI tools interact with different levels of the writing process within EFL academic writing contexts (Rahman et al., 2025). Moreover, evidence regarding whether dependency patterns differ across gender remains limited and inconclusive. As a result, a clearer understanding of how these dimensions manifest in EFL learners remains needed (Lam et al., 2025; Miftahur Ridha et al., 2024).

In the context of STKIP Taman Siswa Bima, ChatGPT has become increasingly common among English major students for academic writing activities. However, empirical evidence regarding students' functional and cognitive dependency on ChatGPT, examined as theoretically distinct constructs, remains scarce in this setting. This study was therefore conducted to examine patterns of functional and cognitive dependency on ChatGPT in academic writing and to describe how these patterns manifest among male and female EFL students. The findings are expected to contribute to the growing discussion on AI-assisted writing by offering a more nuanced understanding of dependency dimensions and providing insights for educators in promoting the responsible and pedagogically appropriate use of AI in higher education.

RESEARCH METHODS

Research Design

This study employed a descriptive quantitative research design to investigate students' functional and cognitive dependency on ChatGPT in academic writing. Descriptive quantitative research is appropriate for identifying and describing observable patterns within a specific population without examining causal relationships (Hu et al., 2020; Siedlecki, 2020). The study focused on describing students' dependency tendencies and comparing these patterns between male and female students.

The study was conducted during the 2025/2026 academic year at STKIP Taman Siswa Bima, West Nusa Tenggara, Indonesia. Data collection was conducted after participants had gained sufficient experience using ChatGPT for academic writing activities.

Research Target/Subject

The population of this study consisted of fourth-semester students of the English Department at STKIP Taman Siswa Bima. Participants were selected using purposive sampling to ensure that all respondents had relevant experience with ChatGPT-assisted academic writing.

The inclusion criteria were:

(1) actively enrolled as fourth-semester students in the English Department,

(2) having prior experience using ChatGPT for academic writing tasks, and

(3) voluntarily agreeing to participate in the study. Based on these criteria, ten students were selected as research participants.

Research Procedure

The study was conducted in two stages. First, participants completed a questionnaire designed to measure their level of functional and cognitive dependency on ChatGPT in academic writing. Second, participants completed a self-reflection task to provide additional explanations regarding their experiences and patterns of ChatGPT use. The self-reflection responses were analysed using a thematic approach to identify recurring patterns and individual variations in participants' reported use of ChatGPT. Each response was read iteratively to extract meaningful units related to the two dependency dimensions. These units were then coded and grouped into emerging themes such as reasons for using ChatGPT, perceived benefits, and awareness of over-reliance, which were subsequently compared against the quantitative findings from the questionnaire. This process of data triangulation served to corroborate, elaborate, or qualify the patterns identified through descriptive statistics, thereby strengthening the overall credibility and interpretive depth of the findings.

Instruments and Data Collection Techniques

Data were collected using a questionnaire as the primary instrument and a self-reflection task as a supporting instrument. The questionnaire employed a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

It consisted of three sections: demographic information, functional dependency, and cognitive dependency. The demographic section gathered information regarding gender, semester, study program, and frequency of ChatGPT use for academic writing.

The functional dependency dimension consisted of eight items measuring students' reliance on ChatGPT for grammar correction, vocabulary enhancement, sentence construction, paraphrasing, writing confidence, and language accuracy. The cognitive dependency dimension included eight items assessing students' reliance on ChatGPT for idea generation, text organization, argument development, decision-making, and other higher-order writing processes.

Table 1: *Functional Dependency on ChatGPT*

No	Statement	REASONS
FD1	I use ChatGPT to correct grammatical errors in my academic writing.	
FD2	I rely on ChatGPT to improve my vocabulary choice when writing academic texts.	
FD3	ChatGPT helps me formulate sentences more accurately in academic writing.	
FD4	I use ChatGPT to paraphrase sentences or paragraphs in my academic assignments.	
FD5	I feel more confident submitting my academic writing after using ChatGPT.	
FD6	I find it difficult to write grammatically correct academic texts without ChatGPT.	
FD7	ChatGPT reduces the amount of time I need to edit or revise grammar and vocabulary in my writing.	

No	Statement	REASONS
FD8	I depend on ChatGPT to ensure language accuracy in my academic writing.	

Table 2: *Cognitive Dependency on ChatGPT*

No	Statement	REASONS
CD1	I use ChatGPT to generate ideas for my academic writing topics.	
CD2	ChatGPT helps me organize the structure of my academic essays or papers.	
CD3	I rely on ChatGPT to develop arguments in my academic writing.	
CD4	I use ChatGPT to help me decide what content should be included in my writing.	
CD5	ChatGPT influences the way I think about my writing topics.	
CD6	I find it difficult to start writing academic texts without assistance from ChatGPT.	
CD7	I often accept ChatGPT's suggestions without critically evaluating the idea or paragraph development from that.	
CD8	ChatGPT reduces the need for me to think deeply when writing academic texts.	

To enrich data interpretation, an open-ended response column was provided for each questionnaire item. In addition, participants completed a self-reflection task in which they responded to guiding prompts about their experiences using ChatGPT for academic writing. The prompts directed participants to describe specific instances of ChatGPT use, identify which aspects of writing they relied on AI for, articulate their reasons for doing so, and reflect on whether they perceived such reliance as beneficial or potentially limiting to their independent writing development. Responses were written in an open-ended format, allowing participants to elaborate freely on their experiences across both functional and cognitive dimensions of dependency.

Content validity was established through expert judgment. The questionnaire was reviewed by experts in English education and academic writing to evaluate the relevance, clarity, and alignment of the items with the constructs of functional and cognitive dependency.

Data analysis technique

Prior to the main analysis, the reliability of the questionnaire was assessed using Cronbach's Alpha coefficient to ensure internal consistency within each dimension. A coefficient value of .70 or above was considered acceptable for research purposes. The functional dependency subscale demonstrated good internal reliability ($\alpha = .830$), while the cognitive dependency subscale yielded an acceptable coefficient ($\alpha = .632$). Although the latter falls slightly below the conventional threshold, it remains within an acceptable range for exploratory research with small samples and is therefore retained for descriptive analysis. Construct validity was established through expert judgment, in which the questionnaire items were reviewed by specialists in English education and academic writing to confirm their alignment with the theoretical constructs of functional and cognitive dependency. The collected data were then analysed using descriptive statistical techniques, including mean scores and percentage distributions. To enable comparison between dimensions, aggregate mean scores were calculated for each subscale, the Functional Dependency subscale (FD1–FD8) and the Cognitive Dependency subscale (CD1–CD8) by summing and averaging item scores per participant. These aggregate scores served as the primary basis for determining the relative dominance of each dependency dimension. The functional dependency subscale yielded an aggregate mean of 3.66 (High category), while the cognitive dependency subscale yielded an aggregate mean of 3.29 (Moderate category), providing clear statistical support for the conclusion that functional dependency is more dominant. Furthermore, mean scores were calculated separately for male and female respondents to describe dependency patterns by gender.

The self-reflection responses were analysed using a thematic approach, in which responses were read iteratively to identify recurring patterns related to functional and cognitive dependency. Meaningful

units were coded and grouped into themes, including reasons for using ChatGPT, perceived benefits, and awareness of overreliance. These themes were then triangulated with the quantitative findings to corroborate, elaborate on, or qualify the observed dependency patterns, thereby strengthening the interpretive depth of the overall analysis. The results were interpreted as observable patterns of dependency rather than evidence of causal relationships.

RESULTS AND DISCUSSION

This study aims to investigate students' functional and cognitive dependence on ChatGPT in academic writing by identifying usage patterns and examining how these patterns are distributed across gender groups. The analysis focuses on describing the extent to which students rely on ChatGPT for both surface-level writing assistance and higher-order cognitive processes. The findings of this study are presented in a descriptive manner through tables and narrative explanations. The results are intended to illustrate observable patterns of dependency rather than to test or confirm statistically significant differences between groups. Therefore, any variations identified across gender should be interpreted as general tendencies within the sample rather than definitive or generalizable distinctions.

This interpretation is aligned with the descriptive quantitative design adopted in this study, which emphasizes the identification and explanation of patterns of functional and cognitive dependency on ChatGPT in academic writing, rather than examining causal relationships or inferential statistical significance.

Functional Dimension (FD1–FD8)

Quantitative Results (SPSS)

Table 3. Frequency Table Functional Dependency 1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	10,0	10,0	10,0
	Neutral	3	30,0	30,0	40,0
	Agree	4	40,0	40,0	80,0
	Strongly Agree	2	20,0	20,0	100,0
	Total	10	100,0	100,0	

FD1 examines students' use of ChatGPT for correcting grammatical errors in academic writing. The findings indicate that most students agree with this statement, suggesting that grammar correction is one of the primary functions of ChatGPT usage. This reflects students' awareness of their linguistic limitations and their reliance on AI to improve accuracy. It can be concluded that ChatGPT plays a significant role in supporting students' grammatical competence, although frequent reliance may reduce opportunities for independent error correction.

Table 4. Functional Dependency 2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	1	10,0	10,0	10,0
	Neutral	3	30,0	30,0	40,0
	Agree	5	50,0	50,0	90,0
	Strongly Agree	1	10,0	10,0	100,0
	Total	10	100,0	100,0	

FD2 focuses on students' reliance on ChatGPT to enhance vocabulary choice. The results show a high level of agreement, indicating that students frequently depend on ChatGPT to select more appropriate or academic words. This suggests that ChatGPT is perceived as a resource for lexical enrichment. However, this reliance may limit students' ability to independently develop vocabulary through learning and practice.

Table 5. Functional Dependency 3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	1	10,0	10,0	10,0
	Agree	8	80,0	80,0	90,0
	Strongly Agree	1	10,0	10,0	100,0
	Total	10	100,0	100,0	

FD3 examines the role of ChatGPT in helping students construct sentences. The findings reveal strong agreement, indicating that students use ChatGPT to produce more structured and coherent sentences. This suggests that ChatGPT functions not only as a correction tool but also as a language-generation tool. It can be concluded that this form of dependency may influence students' writing style and reduce their active involvement in sentence formation.

Table 6. Functional Dependency 4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	1	10,0	10,0	10,0
	Neutral	4	40,0	40,0	50,0
	Agree	3	30,0	30,0	80,0
	Strongly Agree	2	20,0	20,0	100,0
	Total	10	100,0	100,0	

FD4 explores the use of ChatGPT for paraphrasing. The results indicate that students commonly rely on ChatGPT to rephrase sentences or paragraphs. This reflects the practical use of AI in avoiding plagiarism and improving expression. However, over-reliance on paraphrasing tools may hinder students' ability to re-express ideas independently.

Table 7. Functional Dependency 5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	2	20,0	20,0	20,0
	Neutral	1	10,0	10,0	30,0
	Agree	5	50,0	50,0	80,0
	Strongly Agree	2	20,0	20,0	100,0
	Total	10	100,0	100,0	

FD5 measures students' confidence after using ChatGPT. The findings show that students feel more confident in submitting their work after AI assistance. This suggests that ChatGPT contributes positively to students' self-confidence. However, this confidence may be dependent on AI support rather than the students' own writing ability.

Table 8. Functional Dependency 6

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	10,0	10,0	10,0
	Neutral	4	40,0	40,0	50,0
	Agree	4	40,0	40,0	90,0
	Strongly Agree	1	10,0	10,0	100,0
	Total	10	100,0	100,0	

FD6 examines whether students find it difficult to write without ChatGPT. The results indicate moderate agreement, suggesting that some students experience dependency. This reflects an early sign of over-reliance, where students begin to lose confidence in writing independently. It can be concluded that this is a critical indicator of functional dependency.

Table 9. Functional Dependency 7

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	10,0	10,0	10,0
	Neutral	2	20,0	20,0	30,0
	Agree	4	40,0	40,0	70,0
	Strongly Agree	3	30,0	30,0	100,0
	Total	10	100,0	100,0	

FD7 focuses on the role of ChatGPT in reducing editing time. The findings show that students agree that ChatGPT makes the writing process faster. This indicates that efficiency is a key reason for AI usage. While beneficial, this may reduce students' engagement in the revision process.

Table 10. Functional Dependency 8

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	2	20,0	20,0	20,0
	Neutral	1	10,0	10,0	30,0
	Agree	6	60,0	60,0	90,0
	Strongly Agree	1	10,0	10,0	100,0
	Total	10	100,0	100,0	

FD8 examines students' dependence on ChatGPT to ensure language accuracy. The results indicate agreement, suggesting that students rely on AI to validate their writing. This highlights a deeper level of dependence, in which students rely on external tools rather than internal knowledge. It can be concluded that this may affect long-term language development.

The findings indicate that ChatGPT is predominantly used as a functional support tool in students' academic writing. Students tend to use the platform to assist with language-related aspects such as grammar correction, vocabulary selection, sentence construction, paraphrasing, and language accuracy. This pattern suggests that students perceive ChatGPT as a practical solution for overcoming linguistic challenges encountered during the writing process. Regarding grammar correction, students generally acknowledge ChatGPT's usefulness in identifying and correcting grammatical errors. This finding demonstrates that the technology serves as an accessible language support system, particularly for students who may experience difficulties in producing grammatically accurate academic texts. The tendency to rely on AI-based corrections may be explained by students' desire to enhance writing quality efficiently while minimizing language mistakes. A similar pattern emerges in vocabulary development. Students frequently employ ChatGPT to identify more suitable academic expressions and improve lexical variety. This indicates that the platform is not only viewed as a corrective tool but also as a resource for language enrichment. Nevertheless, excessive reliance on AI-generated vocabulary may reduce opportunities for students to independently expand their lexical knowledge through reading and language practice.

The results also reveal that students commonly use ChatGPT to construct sentences and improve textual coherence. Such findings suggest that ChatGPT functions beyond simple proofreading, contributing directly to the production of written content. While this support can improve readability and organization, it may also reduce students' active engagement in developing sentence structures independently. In relation to paraphrasing, participants report that ChatGPT assists them in reformulating ideas and avoiding repetitive wording. This reflects the increasing role of AI in supporting academic integrity and enhancing expression. However, dependence on automated paraphrasing may limit students' ability to internalize paraphrasing skills and develop their own academic voice.

Another important finding concerns students' confidence in writing. The use of ChatGPT appears to increase confidence when completing and submitting academic assignments. This may occur because students perceive AI-assisted texts as more accurate and academically acceptable. Although such confidence can positively affect writing performance, it may gradually shift from self-confidence in

personal ability to confidence derived from technological support. The data further indicate that some students experience difficulties when writing without ChatGPT. This tendency suggests the emergence of functional dependency, in which AI assistance becomes integrated into the writing process to the point that students feel less capable of completing tasks independently. Such a pattern may develop because continuous AI support reduces students' need to engage fully in language production activities. Students also report that ChatGPT contributes to greater efficiency by reducing the time required for drafting and editing. This finding explains why the technology has become increasingly attractive in academic contexts. Faster completion of writing tasks allows students to manage their workloads more effectively; however, it may also reduce their engagement in reflective revision processes essential to developing writing competence.

Furthermore, students rely on ChatGPT to verify the accuracy of their language before submitting their work. This reliance reflects a deeper functional dependency, as students increasingly trust external technological validation over their own linguistic judgment. While beneficial in the short term, such dependency may influence the long-term development of language awareness and self-editing skills.

Overall, the findings demonstrate that students exhibit a moderate-to-high level of functional dependency on ChatGPT. The platform is primarily used to address the technical and linguistic aspects of writing, thereby improving accuracy, efficiency, and confidence. Nevertheless, the results also indicate emerging dependency, particularly as students begin to rely on AI for tasks that traditionally require independent language processing. These findings suggest that the educational use of ChatGPT should be accompanied by strategies that encourage students to maintain active engagement in the writing process and continue developing autonomous writing skills.

These quantitative patterns are further corroborated by the self-reflection data, in which participants identified grammar correction and vocabulary selection as their primary motivations for using ChatGPT, consistent with the first theme emerging from the thematic analysis of reflective responses.

Cognitive Dimension (CD1–CD8)

Quantitative Results (SPSS)

Table 11 Cognitive Dependency 1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	5	50,0	50,0	50,0
	Agree	5	50,0	50,0	100,0
	Total	10	100,0	100,0	

CD1 explores students' use of ChatGPT to generate ideas. The findings indicate moderate to high agreement, suggesting that students rely on AI to initiate writing. This reflects the role of ChatGPT as a cognitive support tool. However, this may reduce students' ability to brainstorm independently.

Table 12 Cognitive Dependency 2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	10,0	10,0	10,0
	Neutral	3	30,0	30,0	40,0
	Agree	5	50,0	50,0	90,0
	Strongly Agree	1	10,0	10,0	100,0
	Total	10	100,0	100,0	

CD2 examines how ChatGPT helps organize writing. The results show that students use AI to structure their essays. This indicates that ChatGPT supports logical organization. However, reliance on AI may limit students' skills in structuring ideas independently.

Table 13 Cognitive Dependency 3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	1	10,0	10,0	10,0
	Neutral	5	50,0	50,0	60,0
	Agree	4	40,0	40,0	100,0
	Total	10	100,0	100,0	

CD3 focuses on argument development. The findings indicate that some students rely on ChatGPT to build arguments. This suggests that AI is involved in higher-order thinking processes. It can be concluded that this is a sign of emerging cognitive dependency.

Table 14. Cognitive Dependency 4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	1	10,0	10,0	10,0
	Neutral	4	40,0	40,0	50,0
	Agree	5	50,0	50,0	100,0
	Total	10	100,0	100,0	

CD4 examines the use of ChatGPT in deciding what content to include. The results show moderate agreement, indicating partial reliance. This suggests that students sometimes depend on AI to guide their writing decisions.

Table 15**.** Cognitive Dependency 5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	4	40,0	40,0	40,0
	Agree	6	60,0	60,0	100,0
	Total	10	100,0	100,0	

CD5 explores whether ChatGPT influences students' thinking. The findings indicate agreement, suggesting that AI shapes how students understand topics. This reflects the cognitive impact of AI use.

Table 16. Cognitive Dependency 6

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	10,0	10,0	10,0
	Disagree	2	20,0	20,0	30,0
	Neutral	3	30,0	30,0	60,0
	Agree	3	30,0	30,0	90,0
	Strongly Agree	1	10,0	10,0	100,0
	Total	10	100,0	100,0	

CD6 examines the difficulty in starting writing without ChatGPT. The results show moderate agreement, indicating that some students depend on AI to begin writing. This suggests a reduced ability to initiate ideas independently.

Table 17 Cognitive Dependency 7

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	10,0	10,0	10,0
	Disagree	5	50,0	50,0	60,0
	Neutral	1	10,0	10,0	70,0
	Agree	3	30,0	30,0	100,0
	Total	10	100,0	100,0	

CD7 focuses on whether students accept AI output without evaluation. The findings show lower agreement, indicating that students still critically assess ChatGPT responses. This suggests that cognitive dependency is not absolute.

Table 18. Cognitive Dependency 8

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	2	20,0	20,0	20,0
	Neutral	5	50,0	50,0	70,0
	Agree	1	10,0	10,0	80,0
	Strongly Agree	2	20,0	20,0	100,0
	Total	10	100,0	100,0	

CD8 examines whether ChatGPT reduces deep thinking. The results indicate moderate agreement, suggesting that AI may reduce cognitive effort in some cases. However, this tendency is not dominant.

The findings show that ChatGPT also plays a role in supporting students' cognitive processes during academic writing, although the level of dependency is less pronounced than in the functional dimension. Students use ChatGPT to generate ideas, organize content, develop arguments, and guide decision-making throughout the writing process.

The use of ChatGPT for idea generation indicates that students often view AI as a starting point for writing activities. This suggests that the platform serves as a cognitive scaffold, helping students overcome difficulties in generating initial ideas. Such reliance may be explained by the challenges students face when beginning academic writing tasks, particularly when they are unfamiliar with a topic or experience writer's block. Students also utilize ChatGPT to organize and structure their writing. The findings suggest that AI contributes to the development of more coherent and logically arranged texts. While this support may enhance the overall quality of written work, it may simultaneously reduce opportunities for students to independently practice organizing and sequencing ideas.

Another notable finding concerns argument development. Some students rely on ChatGPT to strengthen or expand their arguments, suggesting that AI is engaged in more advanced cognitive processes. This suggests a shift from purely linguistic assistance toward support in higher-order thinking processes. Such a tendency may represent an early stage of cognitive dependency, particularly when students increasingly depend on AI-generated reasoning. The results further indicate that students occasionally use ChatGPT to determine what information to include in their writing. This reflects partial reliance on AI in making content-related decisions. Although the platform can provide useful guidance, excessive reliance on it may weaken students' ability to evaluate and prioritize information independently.

The influence of ChatGPT on students' thinking processes is also evident. Students acknowledge that AI-generated responses can shape their understanding of topics and influence how they approach writing tasks. This finding highlights the broader cognitive impact of AI technologies in educational contexts, extending beyond language support to knowledge construction and interpretation. Some participants report difficulties initiating writing without ChatGPT, suggesting that AI has become an important trigger for cognitive engagement. This tendency may indicate a reduction in students' confidence in generating ideas independently, particularly as they become accustomed to receiving immediate assistance from AI systems. However, the findings also reveal that students do not blindly accept AI-generated outputs. Many participants report evaluating, modifying, or selectively using ChatGPT responses before incorporating them into their work. This demonstrates the continued presence of critical awareness and suggests that cognitive dependency remains limited rather than absolute. Similarly, the findings on deep thinking show only moderate concern about the potential reduction in cognitive effort. While AI may simplify certain aspects of the writing process, students generally continue to engage with the content and maintain a degree of intellectual involvement. This indicates that ChatGPT functions primarily as a support mechanism rather than a complete substitute for cognitive activity.

Overall, the cognitive dimension reflects a moderate level of dependency. ChatGPT assists students in managing complex writing tasks, including idea generation, organization, and argument development.

Nevertheless, students largely retain their capacity for evaluation and critical judgment, preventing complete reliance on AI-generated content. These findings suggest that integrating ChatGPT into academic writing can support cognitive performance when accompanied by reflective and critical use practices. This interpretation is triangulated by self-reflection responses, in which a number of participants cited difficulty initiating ideas and structuring arguments as key motivations for cognitive reliance on ChatGPT, elaborating on the moderate dependency patterns observed in the quantitative findings.

The combined findings indicate that students' interaction with ChatGPT involves both functional and cognitive dimensions, although functional dependency appears more dominant. Students primarily use ChatGPT to address technical aspects of writing, while cognitive support is employed more selectively for idea generation and content organization. This pattern may be explained by the immediate and observable benefits offered by ChatGPT in improving language accuracy and writing efficiency. Technical writing challenges are often easier to identify and resolve through AI assistance, making functional usage more frequent. In contrast, higher-order cognitive tasks require greater personal engagement, which may explain the relatively lower level of cognitive dependency observed among participants.

Importantly, students demonstrate awareness of the limitations of AI-generated content. This is evidenced by the third theme emerging from the thematic analysis of self-reflection data, awareness of over-reliance, in which participants reported evaluating, modifying, and selectively incorporating ChatGPT outputs rather than accepting them uncritically. This reflective awareness qualifies the quantitative dependency patterns, suggesting that students retain a degree of cognitive agency despite their reliance on AI assistance. This indicates that, despite the presence of dependency, students have not completely relinquished their role as active writers and decision-makers.

Nevertheless, the reported difficulties in writing without ChatGPT and the growing reliance on AI for both linguistic and cognitive support suggest a gradual pattern of dependency. If not carefully managed, this tendency may affect the development of independent writing competence and critical thinking skills. Therefore, educational practices should emphasize the balanced use of AI technologies, ensuring that ChatGPT functions as a supportive resource rather than a replacement for students' own intellectual and linguistic abilities.

Table 19. Interpretation of Case Processing Summary

Case Processing Summary

	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
FD total Gender of Respondents	10	100,00%	0	0,00%	10	100,00%
CD total Gender of Respondents	10	100,00%	0	0,00%	10	100,00%

The analysis included all responses collected from participants, with no missing or excluded data. The completeness of the dataset strengthens the credibility of the findings, as every respondent contributed fully to both the functional and cognitive dependency analyses. Consequently, the results provide a comprehensive representation of the participants' experiences and perceptions regarding the use of ChatGPT in academic writing.

Dependency Across Gender

The comparison between male and female respondents reveals a similar pattern of ChatGPT utilization, although female students demonstrate a slightly stronger tendency toward both functional and cognitive dependency. This finding may reflect differences in learning preferences, writing strategies, or attitudes toward technological assistance. From a functional perspective, female students appear more likely to use ChatGPT to enhance language accuracy and writing quality. Likewise, their slightly higher cognitive dependency suggests a greater willingness to incorporate AI assistance into idea development and organizational processes. However, the observed differences remain relatively small and should not be

interpreted as definitive gender-based distinctions. Given the limited number of participants, these findings are better understood as contextual tendencies rather than statistically meaningful differences. Overall, the results suggest that dependency on ChatGPT is influenced more by individual learning approaches and familiarity with AI technologies than by gender alone.

Respondents' Self-Reflection

The self-reflection data were analysed thematically and yielded three recurring themes that triangulate the quantitative findings: (1) reasons for ChatGPT use, (2) perceived benefits, and (3) awareness of over-reliance. Regarding reasons for use, participants consistently reported that linguistic challenges, particularly in grammar and vocabulary, were the primary triggers for seeking AI assistance, corroborating the high functional dependency scores observed in the questionnaire. A smaller number of participants also cited difficulty generating ideas and structuring arguments as motivations, aligning with the findings on moderate cognitive dependency. In terms of perceived benefits, participants acknowledged improvements in writing efficiency, language accuracy, and confidence in submitting. These reflections elaborate on the quantitative patterns by suggesting that students associate the use of ChatGPT with tangible, immediate outcomes, such as faster editing and improved expression, rather than with long-term skill development. The third theme, awareness of over-reliance, is particularly notable. Several participants expressed concern that excessive AI use may diminish independent thinking and weaken writing autonomy. This awareness qualifies the quantitative observations of dependency patterns, indicating that students have not fully surrendered cognitive control. Some participants reported deliberately drafting independently before using ChatGPT for revision, suggesting a degree of self-regulated AI integration. Nonetheless, participants acknowledged that writing without ChatGPT demands considerably more time and effort, reinforcing the functional dependency pattern identified in the quantitative findings. Overall, the triangulation of self-reflection data with quantitative results strengthens the credibility of the findings and provides a more nuanced understanding of how students navigate the tension between AI-assisted efficiency and the development of independent writing competence.

Interestingly, students report that writing without ChatGPT often requires more time and effort, particularly when generating ideas and selecting appropriate vocabulary. Although these challenges create additional difficulties, respondents also recognize that independent writing contributes to the development of critical thinking and personal authorship.

CONCLUSION

This study demonstrates that ChatGPT has become an important support tool in students' academic writing practices, particularly within the functional dimension. The findings indicate that students primarily use the platform to improve grammatical accuracy, vocabulary, sentence construction, paraphrasing, and overall language quality. These benefits contribute to greater efficiency and confidence during the writing process. In contrast, cognitive dependency is present at a more moderate level. Although ChatGPT assists students in generating ideas, organizing content, and developing arguments, most participants continue to evaluate and selectively use AI-generated outputs. This suggests that students retain a degree of cognitive control and critical awareness when interacting with the technology.

Overall, the study reveals that ChatGPT exerts a stronger influence on technical and linguistic aspects of writing than on higher-order cognitive processes, as reflected by the higher aggregate mean for functional dependency ($M = 3.66$) compared to cognitive dependency ($M = 3.29$). These patterns are consistent with a scaffolding perspective on AI-assisted writing, in which technological tools function as temporary supports that mediate the writing process without fully replacing learners' agency, a dynamic that the functional-cognitive distinction in this study helps to make theoretically visible. The differentiation between functional and cognitive dependency introduced in this study offers a more granular theoretical lens for understanding AI-assisted writing in EFL contexts. By demonstrating that students exhibit higher functional dependency while retaining moderate cognitive engagement, the findings extend existing frameworks of AI-mediated writing by showing that dependency is not monolithic but operates across qualitatively different levels of the writing process. This distinction enriches the theoretical understanding

of how AI tools interact with learner cognition, suggesting that ChatGPT functions primarily as a linguistic scaffold rather than a cognitive substitute in this context. From the perspective of learner autonomy, the findings carry significant theoretical implications. The co-existence of AI reliance and critical self-regulation observed among participants challenges a binary view of autonomy, one that positions AI use as inherently antithetical to independent learning. Instead, the findings suggest that EFL learners can exercise selective and reflective AI use as a form of strategic autonomy, where technological assistance is consciously deployed to manage linguistic barriers while higher-order cognitive engagement is largely preserved. This nuanced conception of autonomy, one that accommodates AI as a regulated tool rather than a threat contributes to the evolving discourse on learner autonomy in technology-rich EFL environments. Future educational practices should therefore move beyond simply discouraging AI dependency toward cultivating learners' metacognitive awareness of when and how to engage with AI tools. Pedagogical approaches that explicitly develop students' capacity to distinguish between outsourcing language tasks and relinquishing cognitive responsibility may more effectively promote both writing competence and genuine learner autonomy in the age of AI-assisted education.

REFERENCES

Al-obaydi, L. H., Pikhart, M., & Klimova, B. (2023). Can Artificial Intelligence-Driven Chatbots Support. *International Journal of Technologies in Learning*, *18*(21), 39–50.

Aldabbus, S., & Almansouri, E. (2022). Academic Writing Difficulties Encountered by University EFL Learners. *British Journal of English Language Linguistics*, *10*(3), 1–11. https://doi.org/10.37745/bjel.2013/vol10n3111

Almasari, F. (2022). students ' attitudes and achievement. In *Education and Information Technologies*. Springer US. https://doi.org/10.1007/s10639-022-10967-z

Baltezarević, B. V, & Battista, D. (2025). Artificial intelligence and cognitive boundaries: A critical examination of intelligence, understanding, and consciousness. *Knowledge*, *69*(1980), 61–66.

Butson, R., & Spronken-Smith, R. (2024). AI and its implications for research in higher education: a critical dialogue. *Higher Education Research and Development*, *43*(3), 563–577. https://doi.org/10.1080/07294360.2023.2280200

Fan, Y., & Tan, S. (2023). *Beware of Metacognitive Laziness : Effects of Generative Artificial Intelligence on Learning Motivation , Processes , and Performance*.

Graham, O., & Milan, Y. (2025). *The Influence of AI Tools on the Student Writing Process and Compositional Fluency*. 0–24. https://doi.org/10.20944/preprints202506.0832.v1

Hu, K., Fan, J., Li, X., Gou, X., Li, X., & Zhou, X. (2020). The adverse skin reactions of health care workers using personal protective equipment for COVID-19. *Medicine (United States)*, *99*(24), E20603. https://doi.org/10.1097/MD.0000000000020603

Lam, L., Ng, F., Chan, T., & Lam, C. K. (2025). *AI Writing Assistance Technology Adoption in English Writing : A Cross- AI Writing Assistance Technology Adoption in English Writing : A Cross-Sectional Study*. *June*, 0–26.

Lingard, L. (2023). Writing with ChatGPT: An Illustration of its Capacity, Limitations & Implications for Academic Writers. *Perspectives on Medical Education*, *12*(1), 261–270. https://doi.org/10.5334/pme.1072

Miftahur Ridha, T. Silvana Sinar, T. S., & Zein, T. T. (2024). Gender-Based Differences in EFL Writing: Linguistic Features in Indonesian High School Students' Narratives. *Elsya : Journal of English Language Studies*, *6*(3), 278–294. https://doi.org/10.31849/elsya.v6i3.22528

Mun, C. (2024). EFL Learners' English Writing Feedback and Their Perception of Using ChatGPT. *STEM Journal*, *25*(2), 26–39. https://doi.org/10.16875/stem.2024.25.2.26

Nepal, T. K. (2024). Exploring the Applications and Challenges of ChatGPT in Research and Academia: A Comprehensive Review. *West Science Interdisciplinary Studies*, *2*(05), 1043–1050. https://doi.org/10.58812/wsis.v2i05.729

Pitts, G., Rani, N., Mildort, W., & Cook, E.-M. (2025). *Students' Reliance on AI in Higher Education: Identifying Contributing Factors*. 86–97. https://doi.org/10.1007/978-3-032-12773-0_9

Qawqzeh, Y. (2024). Exploring the Influence of Student Interaction with ChatGPT on Critical Thinking, Problem Solving, and Creativity. *International Journal of Information and Education Technology*, *14*(4), 596–601. https://doi.org/10.18178/ijiet.2024.14.4.2082

Rahman, G., Mudhsh, B. A., Almutairi, E. A. A., & Kouki, M. (2025). AI-generated text in academic writing: Balancing structural proficiency and intellectual autonomy. *International Journal of Innovative Research and Scientific Studies*, *8*(4), 819–831. https://doi.org/10.53894/ijirss.v8i4.7953

Raptopoulou, A., Almasri, Z., Bahgat, M., Seddek, A., & Elsafty, A. (2024). ChatGPT in Higher Education: Supporting Academic Literacy Through ChatGPT-Based Activities. *European Journal of Education*, *60*(4), 22–46. https://doi.org/10.1111/ejed.70131

Siedlecki, S. L. (2020). Understanding Descriptive Research Designs and Methods. *Clinical Nurse Specialist*, *34*(1), 8–12. https://doi.org/10.1097/NUR.0000000000000493

Sudrajad, W., Fikri, M. H., Perdana, R., & Putra, B. (2024). Productivity and Creativity in English Academic Writing? *EDUCATUM: Scientific Journal of Education*, *2*(2), 48–58.

Teubner, T., Flath, C. M., Weinhardt, C., van der Aalst, W., & Hinz, O. (2023). Welcome to the Era of ChatGPT et al.: The Prospects of Large Language Models. *Business and Information Systems Engineering*, *65*(2), 95–101. https://doi.org/10.1007/s12599-023-00795-x

Waliyudin, & Annisah. (2023). Meningkatkan Kemampuan Menulis Mahasiswa melalui Metode Self-Assessment. *Kreatif*, *21*(2), 235–246.

Yatani, K., Sramek, Z., & Yang, C.-L. (2024). AI as Extraherics: Fostering Higher-order Thinking Skills in Human-AI Interaction. In *Preprint* (Vol. 1, Issue 1). Association for Computing Machinery. http://arxiv.org/abs/2409.09218

Yıldız, T. (2025). The Future of Digital Education: Artificial Intelligence, the Metaverse, and the Transformation of Education. *İstanbul Üniversitesi Sosyoloji Dergisi / İstanbul University Journal of Sociology*, *44*(2), 921–940. https://doi.org/10.26650/sj.2024.44.2.0664

Yuan, Y., Li, H., & Sawaengdist, A. (2024). The impact of ChatGPT on learners in English academic writing: opportunities and challenges in education. *Language Learning in Higher Education*, *14*(1), 41–56. https://doi.org/10.1515/cercles-2023-0006

Zhai, C., Wibowo, S., & Li, L. D. (2024). The effects of over-reliance on AI dialogue systems on students' cognitive abilities: a systematic review. *Smart Learning Environments*, *11*(1). https://doi.org/10.1186/s40561-024-00316-7

Zhao, Y., & Li, J. (2024). Opportunities and challenges of integrating artificial intelligence in China's elderly care services. *Scientific Reports*, *14*(1), 784–793. https://doi.org/10.1038/s41598-024-60067-w

Zou, D., Xie, H., & Wang, F. L. (2023). Effects of technology enhanced peer, teacher and self-feedback on students' collaborative writing, critical thinking tendency and engagement in learning. *Journal of Computing in Higher Education*, *35*(1), 166–185. https://doi.org/10.1007/s12528-022-09337-y